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ABSTRACT

This paper analyzes syllables in Liangshan Yi, a Tibeto-Burman language also known as Nosu and spoken in the Sichuan Province of China, and provides a detailed articulatory description of the range of distinctive syllables in the Xide County vernacular. The paper concludes that the phonemicization upon which the standardized version of orthography is based is not an unreasonable one. The analysis looks at patterns in and relationships between tone, phonation type (loose or tight throat), vowel quality, and bilabial trilling. Following an inventory of syllables, a phonemic analysis is presented, and a fourth tone category, a high-mid tone, is identified. (MSE)

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Proceeding from Syllable Inventory to Phonemic Inventory in the Analysis of Liangshan Yi

Andy Eatough

Liangshan Yi (also known as Nosu, spoken in Sichuan Province, China) has many phonetically-interesting syllables. In this paper an articulatory description of the full range of distinctive syllables of this language is given and it is shown that the standard phonemicization of these is reasonable.

Introduction

Liangshan Yi (Nosu) is spoken in Liangshan Prefecture and in adjacent parts of several neighboring prefectures in southwestern Sichuan Province, and in nearby parts of northwestern Yunnan Province in the People's Republic of China. It is classified by comparative linguists as belonging to the Loloish subgroup of Tibeto-Burman. The language has a traditional orthography which has been in continuous use for many centuries. A standardization of this orthography has been devised and promoted by the Sichuan Language Commission, and the vernacular of Xide County, Liangshan Prefecture, has been chosen to provide the phonological basis for this standardization. Although an important isogloss bundle passes through Xide County, the phonetics of the speech varieties there are fairly uniform, and there is a widely agreed upon phonemicization for them. There are numerous sources available in Chinese which give this phonemic analysis, but none of them start from the phonetics to give the rationale behind the phonemicization. It is simply assumed that the phonemicization is correct, and any phonetic description that might be given is less detailed than would be necessary to reconstruct this phonemicization. In this paper I give a more detailed articulatory description of the range of distinctive syllables in the Xide County vernacular, and show that the standard phonemic analysis is a reasonable one.

The Syllables of Liangshan Yi

The syllable is a phonological notion rather than a purely phonetic notion. Though certain phonetic definitions work well for many languages, none has been proposed which works perfectly for every language. Therefore, we must determine some reasonable criteria for determining what is a syllable in Yi. Most of the syllables in most of the world's languages have one sonority peak; the most common syllable type worldwide is CV, an onset consisting of one consonant followed by a rhyme of one vowel. There are many clear cases of CV syllables in Yi, so let us look first at some of them to see what criteria there might be in Yi for deciding what is a syllable in the less clear cases. In the following fairly close transcription, underlining indicates a tight throat[1] (raised larynx and/or retracted tongue root, resulting in a smaller pharyngeal cavity). The vowels other than [o̲] may, in slow speech or pre-pausally, be pronounced with slight diphthongization, gliding from a slightly closer vowel to a slightly more open vowel.

(1) [mo#] *soldier*
(2) [mo&] *to see*
(3) [mo$] *female*
(4) [mo̲&] *to dream*

[1] Ladefoged and Maddieson 1990 and Maddieson and Hess 1986 use the terms 'tense' and 'lax', perhaps because they are literal translations of the words used in the Chinese literature to describe these phonation types. They are somewhat non-committal as to the exact nature of the articulation of these phonation types in Yi.

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(5) [mQ&] *bamboo*
(6) [me#] *hungry*
(7) [me&] *to get along with*
(8) [me$] *to stop blowing*
(9) [m@&] *to flick (the tongue)*
(10) [lo#] *hand, arm*
(11) [lo&] *boat*
(12) [lC&] *short amount of time*
(13) [lF&] *ox*
(14) [lQ&] *to come*
(15) [le#] *to not be busy*
(16) [le&] *to go (uphill)*
(17) [l@&] *to burn*
(18) [le$] *elephant*

From the examples above, we can gather that there are tones in Yi, and hypothesize that all syllables in Yi have a corresponding tone. It is also worth noting that, at least in these examples, there appears to be a correspondence between certain vowel qualities and a tight throat phonation. Let us therefore hypothesize that the phonologically relevant difference between [mo&] and [mC&], between [me&] and [m@&], and between [lF&] and [lQ&] is the loose throat versus tight throat distinction, not the vowel quality, with the vowel qualities being affected by the phonation type. Evidence for the phonation type being the phonologically relevant distinction in these pairs comes from a kind of vowel harmony in compound words, in which a loose throat vowel becomes a tight throat vowel when the following syllable has a tight throat vowel. [2]

(19) [lo#] *hand, arm* + [ka&] *palm* > [lC#ka&] *palm of hand*
(20) [jo&] *sheep* + [Na#] *castrated* > [jC$Na#] *castrated sheep*
(21) [e#] *to sleep* + [mC$] *dream* > [@#mC$] *a dream during sleep*
(22) [he&] *outside* + [t@&] *layer, fold* > [h@&t@&] *foreign*
(23) [dze#] *pepper* + [ma&] *small round thing* > [dz@#ma&] *peppercorn*
(24) [lF&] *ox* + [ta&] *to tie* > [la&ta&] *yoke*
(25) [qgF&] *buckwheat* + [nC&] *black* > [qga$nC&] *buckwheat* (sp.)

Let us then assume that there is a tone and a phonation type (tight throat or loose throat) for each syllable in Yi, and that phonological units smaller than the syllable cannot carry their own tone and phonation type. Based on that assumption, we find that there are some syllables that consist only of a vowel.

(26) [o$] *goose*
(27) [C&r@&] *head hair*
(28) [e#] *to sleep*
(29) [emo] *stomach*
(30) [e@ko&] *home*
(31) [e&] (pronoun)
(32) [@&] *duck*
(33) [Q&Ne&] *red*
(34) [Q@mo&] *mother*
(35) [Q#mo$] *old*
(36) [Q$mo&] *not see*

There is also a wide variety of syllables in which the only segment is a phonetic consonant. In the following transcription, there is no diacritic marking consonants as syllabic. Instead, any consonant symbol followed by a tone marker may be assumed to indicate a syllabic consonant. A superscript *w* indicates simultaneous labiovelarization. A ligature joining *m* and *l* indicates simultaneous articulation of the two consonants, so that the tongue is in the position to articulate an

[2] The vowel symbols used are chosen because the vowel sounds are in each case close to the IPA cardinal vowels to which the symbols correspond, though it should be added that [o], [C], [F], [e], and [@] all sound slightly closer than the corresponding IPA cardinal vowels, and [Q] sounds slightly more central.

alveolar lateral, the lips are closed, and the velum is open, allowing air to escape through the nose. The sounds transcribed as postalveolar fricatives are all laminal, but the distinction between the palatalized ones and the non-palatalized ones is easy to hear because the non-palatalized ones are articulated with a rather flat tongue and they almost sound retroflex.

(37) [mS&] *to do*
(38) [kC&lC&mS#] *angry*
(39) [mS$p0#] *horse*
(40) [mS$me#] *about*
(41) [do•mS&] *knife*
(42) [mS&de•] *territory, region*
(43) [e#mS$] *corn*
(44) [mo&mS&] *weather, sky*
(45) [a$ml#] *now*
(46) [a$ml&] *daughter*
(47) [ml#] *to lick (a newborn animal)*
(48) [zF&l&] *descendants*
(49) [l$] *seed*
(50) [l#] *to take off (clothes)*
(51) [lS&] *dragon*
(52) [lS&ma#] *stone*
(53) [lS#] *enough*
(54) [l&ma&] *four (round things)*
(55) [vS&] *dry*
(56) [vS&] *to enter*
(57) [vS$] *to sell*
(58) [vS#] *to push (a mill)*
(59) [a&vS#] *blue, green*
(60) [mS&vS#] *sky, heaven*
(61) [vS&Ne&] *small intestines*
(62) [y&] *to go (downhill)*
(63) [y$] *to be the size of*
(64) [y&] *shadow, image*
(65) [y#] *to saw (wood)*
(66) [Z&] *grass*
(67) [Z$] *to scrape (with knife)*
(68) [z&] *to burn*
(69) [z$] *to hide*
(70) [z&] *to press down on*
(71) [z#] *leopard*
(72) [z$l&z#l&] *messed up (hair)*

There are also many syllables in which, although there is more than one element which could reasonably be identified as a phonetic segment, the most sonorous element in the syllable is nevertheless a phonetic consonant.

(73) [Mml&sz&] *cloth*
(74) [hF&Mml$] *fishnet*
(75) [Mml&] *to close (the eyes)*
(76) [MmS#] *lap*
(77) [MmS&] *to inflate (a pig bladder)*
(78) [MmS&] *mushroom*
(79) [MmS$] *to be as tall as*
(80) [mS&ll&] *the wind*
(81) [ll&] *to flee*
(82) [lF&l#] *bag made of musk deer skin*
(83) [llS&] *to stir-fry*
(84) [llS#] *to watch over (livestock)*
(85) [llS&] *to catch on fire*
(86) [sz&] *anymore*
(87) [sz&] *wood*
(88) [sz$] *to recognize*
(89) [sz#] *thirsty*
(90) [vz#mo$] *female's elder sister*
(91) [vz$] *liver flukes*
(92) [vz&] *to buy*
(93) [fz&] *ugly*
(94) [bz$] *to give to*
(95) [pHz&] *to hurt (said of wounds)*
(96) [pHz#] *to spit*
(97) [pHz&] *to fold*
(98) [pz#] *vagina*

(99) [pz&] *to call (said of eagles)*
(100) [pz$] *to carry on the back*
(101) [tsHz#] *generation*
(102) [tsHz&] *he, she, it*
(103) [tsHz$] *one*
(104) [tsz&] *to plant*
(105) [tsz$vz#] *spittle*
(106) [tsz&] *to crack*
(107) [tsz#] *to dig*
(108) [dz#mS&] *the world*
(109) [dz&] *to ride*
(110) [ndz&] *to be in charge*
(111) [ndz&] *spicy-hot*
(112) [a&ndz#] *pure, clean*
(113) [ndz$] *even, level*
(114) [cy$] *to marry*
(115) [tcHy$Ne&] *river deer*
(116) [lF&tcHy&] *cattle dung*
(117) [wo-tcy&] *bear gall bladder*
(118) [dy$] *underneath*
(119) [dy&] *bronze*
(120) [ndy$] *to believe*
(121) [ndy&] *skin*
(122) [ndy#] *to clear up (weather)*
(123) [dZ&] *tooth*
(124) [ndZ&] *alchoholic beverage*
(125) [tSZ&mS&] *quickly*
(126) [tSZ$] *to rely on*
(127) [tSHZdye] *to become rotten*
(128) [tSHZ#kHvS&] *constellation name*
(129) [tSHZ&] *to call (said of pheasants)*
(130) [SZ$] *seven*
(131) [SZ&] *gold*
(132) [kHvS&] *to steal*
(133) [kHvS#] *year*
(134) [qgvS&] *to love*
(135) [gvS&] *nine*
(136) [fvS#] *six*
(137) [svS$] *like, similar to*
(138) [mS&tSHvS&] *autumn*

There are also syllables in which a trilling of the lips can be involved. This trilling of the lips will be symbolized by a superscript *B*. The bilabial trilling starts with the release of the onset, and continues part way into the rhyme, which in every case is [vS] or [vS]. This trilling is in free variation with the lack thereof, and it tends to be more lenis when there is a preceding bilabial stop, and noticeably more fortis when there is a preceding alveolar stop. In the standard pronunciation, this trilling occurs only when the onset consonant is an alveolar or bilabial stop.[3]

(139) dBvS& *to emerge*
(140) bBvS-re& *yak*
(141) bBvS#zF& *mosquito*
(142) mbBvS& *to have had enough to eat*
(143) ndBvS$ *to hit*
(144) tBvS& *thousand*
(145) mS&tBvS# *fire*
(146) bBvS&dBvS& *writing implement*
(147) a-pHBvS&bBvS&dF& *folktale*
(148) tHBvS# *household*
(149) pBvS& *to return*
(150) pBvS& *badger*

To sum up what we have seen so far, there are six clear cases of phonetic vowels. Three of these have a tight throat phonation, and for each there is a corresponding vowel with a loose throat phonation. There is a large number of consonants which have some of the same characteristics as

[3] Xie Zhili (p.c.) reports that in certain areas (where the northwestern and southwestern varieties of Liangshan Yi come together) there is bilabial trilling that accompanies the palatalized postalveolar onsets. When I heard him demonstrate, I thought of Donald Duck.

the clear cases of vowels, such as carrying tone, carrying a tight-throat/loose-throat distinction, and being the most sonorous element of a syllable. The clear cases of vowels are listed in 151-153, and the syllabic consonants are listed in 154-162. 163 is a chart of all onsets which contrast before the vowels in 151-153.

(151) a̲ / F

(152) e̲ / e

(153) C̲ / o

(154) z̲ / z

(155) Z̲ / Z

(156) y̲ / y

(157) l̲ / l

(158) m̲l̲ / ml

(159) y̲S / vS

(160) l̲S / lS

(161) m̲S / mS

(162) Bv̲S / BvS

(163)

labial	*alveolar*		*postalveolar*	*palatalized*	*velar*	*glottal*
mb	nd	ndz	ndZ	ndy	qg	
b	d	dz	dZ	dy	g	
p	t	ts	tS	tc	k	
pH	tH	tsH	tSH	tcH	kH	
v	z		Z	y	w	
f	s		S	c	x	h
m	n			r	q	
M	N			G		
	l					
	L					

Phonemic Analysis

If we look at the syllabic consonants in 154-162, we see that none of them occurs in as wide a variety of environments as do the vowels in 151-153. The only onsets that ever precede a syllabic [z] or [z̲] are all labial or alveolar obstruents. The only onsets that ever precede [Z] or [Z̲] are postalveolar obstruents. The only onsets that ever precede [y] or [y̲] are palatalized obstruents. The only kind of onset that can precede [l] or [l̲] is a lateral, and the only kind of onset that can precede [ml] or [m̲l̲] is a bilabial nasal. Since these syllabic consonants are all phonetically similar (all involving some kind of coronal stricture) and since they do not occur after the same onsets, let us hypothesize that they are all allophones of the same phoneme. The only potential problem with this is that each of them appears to occur in isolation, i.e., without a distinct phonetic onset, so that it could be argued on this basis that they contrast in identical environments. However, whether they are in fact occurring in isolation comes down to a question of segmentation; for example, does a

word like [z&] 'to burn' consist of an onset [z] and a rhyme [z&], or only of the rhyme [z&]? In 164-173 I list some of the relevant examples, giving a phonemicization that treats these syllabic consonants as allophones of the same vowel phoneme (represented somewhat arbitrarily with the symbol /i/).[4] The analysis is that this vowel completely assimilates to a preceding coronal except in voicing, and is otherwise [z].[5]

(164) [vz&] *to buy* /vi&/
(165) [z&] *to burn* /zi&/
(166) [cy$] *to marry* /ci$/
(167) [y&] *to go (downhill)* /yi&/
(168) [l̪&] *to flee* /li&/
(169) [l$] *seed* /li$/
(170) [sz$] *seven* /si$/
(171) [z$] *to scrape (with knife)* /zi$/
(172) [mml&sz&] *cloth* /mi&si&/
(173) [m̪l#] *to lick (a newborn animal)* /mi#/

Now let us consider the syllabic consonants in 159-162. These are phonetically similar to each other in that they all involve labialization. Furthermore, each of them occurs after distinct onsets. [vS] and [v̪S] occur after labial fricatives, alveolar fricatives, affricates and nasals, postalveolar obstruents, palatalized obstruents, and velar obstruents. The only kind of onset that [lS] or [l̪S] occur after is a lateral, and the only kind of onset [mS] or [m̪S] occur after is a bilabial nasal. [BvS] and [B̪vS] occur after bilabial stops and alveolar stops. The only potential difficulty in treating these syllabic consonants as a single pair of phonemes is that some of these syllabic consonants can occur without a phonetically distinct onset. But as with the phonemes /i/ and /i̪/ proposed above, the problem can be dealt with by assuming that phonemically there is a sequence of two segments, an onset consonant and a phonetically identical or nearly identical rhyme. Some relevant examples are listed in 174-181, with phonemicizations.

(174) [gvS&] *nine* /gu&/
(175) [svS$] *like, similar to* /su$/
(176) [mmS&] *mushroom* /mu&/
(177) [mS&l&] *the wind* /mu&li&/
(178) [lS&] *to stir-fry* /lu&/
(179) [lS&] *dragon* /lu&/
(180) [ndB̪vS$] *to hit* /ndu$/
(181) [pB̪vS&] *badger* /pu&/

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[4] Many of the instances of these phonemes can be reconstructed as coming from proto-Loloish *i.

[5] Actually, 'completely' might be putting it too strongly, since syllabic fricatives, not only in Yi but in other languages like Mandarin Chinese, often involve little audible friction, less than fricatives in onset positions typically involve.

If we combine the vowel phonemes /i/, /i̱/, /u/, and /u̱/ with three vowel phonemes for the clear cases of vowels listed in 151-153, we end up with a ten vowel system, with five pairs of tight throat and loose vowels:

(182) /Q/ [F], /Q̱/ [Q̱]

(183) /e/ [e], /e̱/ [e̱]

(184) /i/ [z ~ Z ~ y ~ l ~ ml], /i̱/ [ẕ ~ Ẕ ~ y̱ ~ ḻ ~ m̱ḻ]

(185) /o/ [o], /o̱/ [C̱]

(186) /u/ [vS ~ mS ~ lS ~ BvS], /u̱/ [v̱S ~ m̱S ~ ḻS ~ Bv̱S]

Since none of the onsets listed in 163 are in complementary distribution with any phonetically similar onsets, there is no reason not to take 163 as a listing of the consonant phonemes.

If we do so, and if we take as our vowel inventory the ten phonemes in 182-186, a few questions remain to be answered. Most literature on standard Yi phonetics mentions a vowel which is like [F] but with a tight throat rather than a loose throat, which we can transcribe phonetically as [E̱].[6] This [E̱] is never actually said in the literature to contrast with [Q̱] and with [F], though such a contrast is implied by some of the charts in which the phonemes are laid out. The fact is, [F] never occurs in the high tone, and [E̱] occurs only in the high tone, and there is no one tone category in which there is a three-way contrast between [F], [E̱], and [Q̱]. It only takes a little abstraction to say that [E̱] is actually the way a phonemically loose throat /a/ is realized in the high tone, the phonetic tightness of the throat being related to the raising of the larynx that often accompanies a high pitch. The standard romanization used in alphabetizing Yi dictionaries assumes such a phonemicization. Examples are given in 187-193, with a phonemicization for each.

(187) tSQ̱& *small thing* /tSa̱&/

(188) tSF$ *bowl* /tSa$/

(189) tSE̱# *.o.k.* /tSa#/

(190) kHF& *dog* /kHa&/

(191) kHE̱#mo$ *evening* /kHa#mo$/

(192) kHQ̱# *happy* /kHa̱#/

(193) kHQ̱& *want* /kHa̱&/

There are certain syllables for which more than one reasonable phonemicization exists. These all involve a question of which of two consonant phonemes is the onset for /i/ or /u/, or questions of whether there is an onset before one of these two vowel phonemes:

(194) [ndz&] *to be in charge* /ndi&/ or /ndzi&/ ?

(195) [tsHz$] *one* /tHi$/ or /tsHi$/ ?

(196) [ẕ#] *leopard* /i̱#/ or /zi̱#/ ?

(197) [v̱S&] *enter* /u̱&/ or /vu̱&/ ?

(198) [a&v̱S#] *green/blue* /a&u̱#/ or /a&vu̱#/ ?

In each of the examples 194-198, I prefer the second phonemicization, but mainly for the reason that the transcriptions used in all the published materials on Yi assume it. (It may also appear to be closer to the phonetic reality, but it only seems that way because of my choosing the

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[6] See Chen Shilin et al. 1985, Dai Peiyu, ed. 1991, Li Min and Ma Ming 1988, Qumu Tiexi 1988, and Zhang Yurong and Zhang Hongze, eds. 1984.

vowel symbols *i* and *u* rather than fricative symbols to write the syllabic consonant phonemes.) In each case one could argue that the first phonemicization leaves us with a gap in the system, and one could equally well argue that the second phonemicization leaves a gap in the system. For example, in 197, if we take /u̱&/ as our analysis, we are left with the question of why /v/ never occurs before /u̱/, when its voiceless counterpart /f/ does. Similarly, if we take /vu̱&/ as our analysis, we are left with the question of why /u̱/ never occurs without an onset, when the vowels /o̱/, /e̱/, /a̱/, /o/, and /e/ clearly do. Historical reconstructions are not very helpful in this case, as the result of taking them too seriously will be ending up with a not very symmetrical system. For example, historical reconstructions would lead us to prefer /ndzi&/ for 194, but /tʰi$/ for 195. But if the vowel /i/ can occur after either alveolar stops or alveolar affricates, why do these two categories of consonants never contrast before /i/? So, in the absence of any evidence commending one analysis over another, the more usual analysis of these syllables is not unreasonable.

Contrastive Tone Categories

If one confines one's attention to underlying forms of morphemes, one might gather that there are only three contrastive tone categories, high, mid, and low, and in fact in some northern varieties of Liangshan Yi there are only three categories. However, a fourth tone category turns out to be necessary in standard Yi, even though at first glance this tone appears to be a predictable, non-contrastive variant of two other tone categories. This fourth tone category, a high-mid tone, has two main sources, (1) a rule that changes a mid tone to a mid-high tone before a mid tone, and (2) a rule that changes a low tone to a mid-high tone after a mid tone. Both tone sandhi rules apply in many, but not all, of the compound words where the phonological environment is met, as well as in certain syntactic contexts, such as across the boundary between an object and a verb. 199 and 200 are examples of the second rule, and 201 is one of the exceptions. 202 and 203 are examples of the first rule, and 204 is one of the exceptions. 205 and 206 are among the most likely candidates for morphemes that are underlyingly mid-high tone.

(199) tʰF$y& *book* + hF$ *to look at* > tʰF$y& ʰF˗ *to look at a book*

(200) wo& *bear* + mo$ *mother* > wo&mo˗ *female bear*

(201) ve& *jackal* + mo$ *mother* > ve&mo$ *female jackal*

(202) gF& *some* + su& > gF˗su& *these/those/the*

(203) a̱& (adjective prefix) + kC̱& *hard* > a̱˗kC̱&

(204) a̱& (adjective prefix) + Ne& *red* > a̱&Ne&

(205) ce˗ *what?*

(206) o˗ (sentence final particle indicating change of state)

Since it is not possible with a three tone analysis to always predict which syllables will have a mid-high tone on the surface, it is necessary to have a four tone analysis, which is consistent with all the literature on this variety of Yi.

Conclusion

I have shown that the phonemicization upon which the standardized version of the orthography is based is not unreasonable for the pronunciation used in Xide County, given the phonetic facts. It is these phonetic facts that attract my real interest, since Liangshan Yi has bilabial trilling in a wider variety of contexts than any other language yet described in the literature, and also has an astonishingly wide variety of syllabic consonants.

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